REVISIONS

LT	DESCRIPTION	DATE	APPROVED
A	Changed manufacturer's eligibility.	24 Aug 1987	Searcy
B	Changes in accordance with NOR 5945-R001-09.	13 Nov 1992	D.E. Moore
C	Changed CAGE 63745 to 16170. Updated to current requirements of MIL-R-28750C. Changed paragraphs 3.5 and 4. Editorial changes throughout.	18 Sep 1995	N.J. Christolear for D.E. Moore
D	Cancel Document.	03 Apr 2000	

Notice of Cancellation

DESC Drawing 85007, dated 13 September 1985 is hereby canceled. No superseding document.

Prepared in accordance with MIL-STD-100

Selected item drawing

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PMIC N/A	**PREPARED BY** Richard A. Yannitti	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OH**
Original date of drawing 13 September 1985	**CHECKED BY** James R. Martin	**TITLE** RELAY, SOLID STATE, HERMETICALLY SEALED, OPTICALLY ISOLATED, 560 MILLIAMPERE, 60 V DC, SPST (N.O.), CMOS INPUT
	APPROVED BY Steve B. Searcy	
	SIZE A / **CODE IDENT. NO.** 037Z3	**DWG NO.** 85007
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AMSC N/A

5945-E099-02

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing establishes the complete requirements for a hermetically sealed solid state relay supplied to the "Y" screening requirements of MIL-R-28750.

1.2 Part or Identifying Number (PIN). The complete PIN will be 85007-001.

2. APPLICABLE DOCUMENTS

2.1 Government specification and standards. Unless otherwise specified, the following specification and standards, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-R-28750 - Relays, Solid State, General Specification For.

STANDARDS

MILITARY

MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-R-28750, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-R-28750, and herein (see figure 1).

3.3 Input characteristics. See figure 2.

3.3.1 Input current. The input current shall be 250 microamperes dc maximum.

3.3.2 Control voltage range. 2.5 V dc to 18 V dc maximum.

3.3.3 Bias supply voltage. The bias supply voltage, V_C, shall be 3.8 V dc to 32 V dc maximum (see table I).

3.3.4 Bias current. 16 milliamperes.

3.3.5 Minimum turn-off voltage (assured). 2.8 V dc maximum.

3.3.6 Maximum turn-on voltage (assured). 0.5 V dc minimum.

3.4 Output characteristics.

3.4.1 Continuous operating output voltage. 60 V dc maximum.

3.4.2 Output current at +25°C. The output current at +25°C shall be 560 milliamperes dc maximum.

3.4.3 Output capacitance. 160 pF at 25 V ac, 1 MHz.

3.4.4 Output leakage current. The output leakage current at +25°C shall be 10 microamperes dc maximum and at +105°C shall be 100 microamperes dc maximum.

TABLE I. Series control/bias resistor selection.

V_C range	3.8 - 6 V	6.0 - 10 V	10 - 14 V	14 - 18 V	18 - 22 V	22 - 26 V	26 - 32 V
R_S ohms	Not required	300	620	910	1200	1500	2000
Power rating (watts)		.25	.25	.25	.25	.5	1

NOTE: Limiting resistor required over 6.0 volts (see table above) when not used with a heat sink, the values are to be determined.

3.4.5 Transient voltage. 80 V dc maximum.

3.5 Electrical characteristics. Unless otherwise specified, ambient temperature for electrical characteristics shall be -55°C to +120°C.

3.5.1 Dielectric withstanding voltage. 1000 V rms (input to output).

3.5.2 Maximum capacitance. 5 pF at 25 V ac, 1 MHz (input to output).

3.5.3 Insulation resistance. 1000 megohms (output to case at 500 V dc).

3.5.4 Turn-on delay. The turn-on delay (T_{dON}) shall be 0.7 millisecond maximum (see figure 3).

3.5.5 Turn-off delay. The turn-off delay (T_{dOFF}) shall be 1.8 milliseconds maximum (see figure 3).

3.5.6 Rise time. The rise time (t_r) shall be 0.8 millisecond maximum (see figure 3).

3.5.7 Fall time. The fall time (t_f) shall be 0.4 millisecond maximum (see figure 3).

3.5.8 Turn-on time. The turn-on time (t_{ON}) shall be 1.5 milliseconds maximum (see figure 3).

3.5.9 Turn-off time. The turn-off time (t_{OFF}) shall be 2.2 milliseconds maximum (see figure 3).

3.5.10 On-resistance. 0.90 ohm maximum.

3.5.11 Reverse polarity. Applicable.

3.5.12 Electromagnetic interference. Applicable.

3.5.13 Exponential rate of voltage rise. Applicable.

3.6 Environmental characteristics.

3.6.1 Operating temperature range. -55°C to +105°C.

3.6.2 Storage temperature range. -55°C to +125°C.

3.6.3 Shock. MIL-STD-202, method 213, test condition I. Relays shall also withstand 1500 g's for 0.5 millisecond.

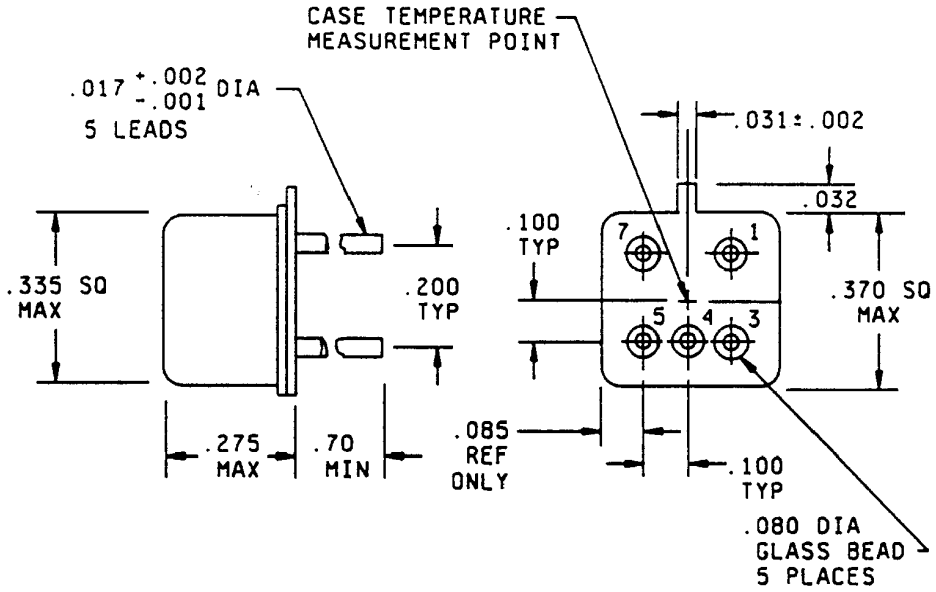
3.6.4 Vibration. MIL-STD-202, method 204, test condition D 100 g's, 10 to 3000 Hz.

3.6.5 Acceleration. MIL-STD-883, method 2001, test condition A, 5000 g's, Y1 axis.

3.6.6 Surge current. 2.0 amperes maximum.

3.6.7 Seal (hermetic). Seal shall be in accordance with MIL-R-28750.

3.7 Physical. Physical requirements shall be as specified herein.



Inches	mm
.001	0.03
.002	0.05
.017	0.43
.031	0.79
.032	0.81
.080	2.03
.085	2.16
.100	2.54
.200	5.08
.275	6.99
.335	8.51
.370	9.40
.70	17.8

NOTES:
1. Dimensions are in inches.
2. Metric equivalent are given for general information only.
3. Unless otherwise specified, tolerances are ±.005 (0.13 mm) for three place decimals and ±.01 (0.3 mm) for two place decimals.
4. Circuit diagram shown on part is terminal view.

FIGURE 1. Outline drawing and dimensions.

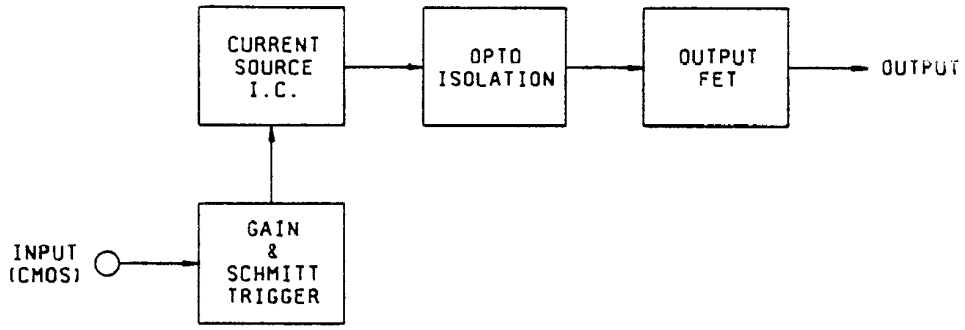
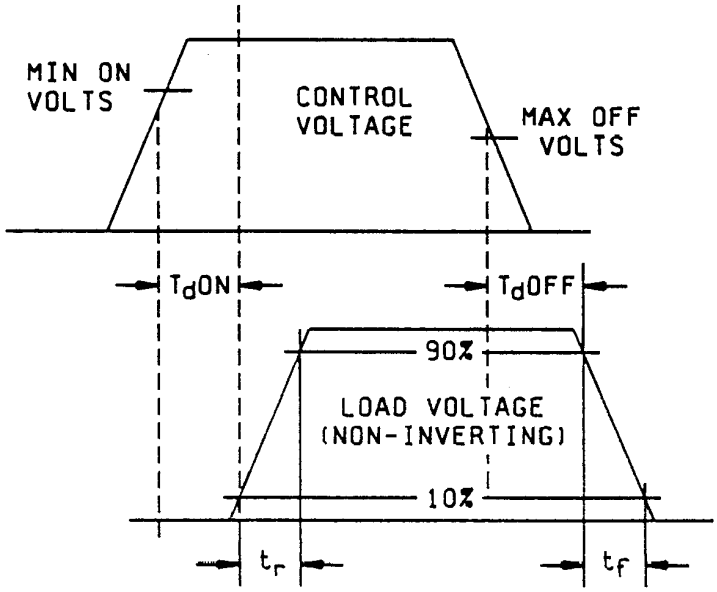


FIGURE 2. Block diagram.



NOTES:
1. $t_{ON} = T_{dON} + t_r$
2. $t_{OFF} = T_{dOFF} + t_f$

FIGURE 3. Turn-on and turn-off time waveform.

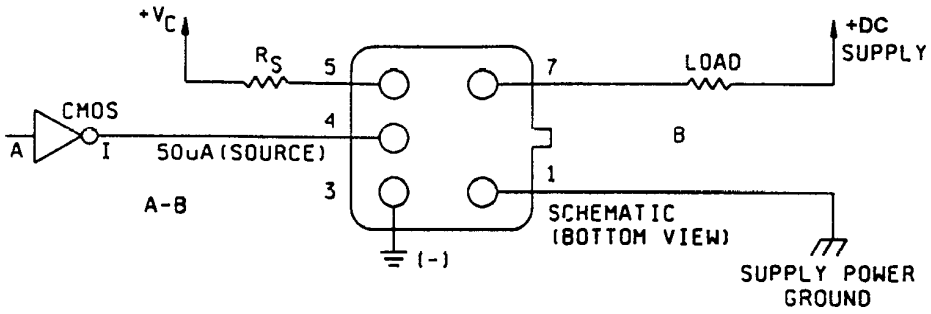


FIGURE 4. Wiring diagram.

3.7.1 Weight.

3.7.2 Wiring diagram. See figure 4.

3.8 Marking. Marking shall be in accordance with MIL-R-28750 except the PIN shall be in accordance with 1.2 herein. The "M28750/X-XXX" PIN shall not be used.

3.9 Quality assurance requirements. Relays furnished under this drawing shall have been subjected to, and passed all the requirements, tests, and inspections detailed herein.

3.9.1 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-R-28750 and 4.2 herein.

3.10 Certification as an approved source of supply. In order to be listed as an approved source of supply for relays manufactured to this drawing, a manufacturer shall:

a. Agree to make available to DESC, upon request, all pertinent test data on its production of the subject part, including, but not limited to, test data in accordance with the qualification inspection table of MIL-R-28750, Y-screening level.

b. Provide to DESC-ELDM or its designated agent, upon request, free of charge and without obligation, a current production sample from its production of the subject part.

c. Meet one of the following criteria:

(1) Currently possess listing on qualified products list QPL-28750 for at least one part.

(2) Be in current production of the subject part.

3.11 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply (see 6.6 and 6.7).

4. QUALITY ASSURANCE PROVISIONS

4.1 Product assurance program. The product assurance program specified in MIL-R-28750 is not applicable to this document.

4.2 Statistical process control. The statistical process control program specified in MIL-R-28750 is not applicable to this document.

4.3 Quality conformance inspection.

4.3.1 Inspection of product for delivery. Inspection of product for delivery shall consist of the group A inspections of MIL-R-28750 for the Y screening level. Group A testing shall be performed on each inspection lot and manufacturers shall keep lot records for 3 years (minimum), monitor for compliance to the prescribed procedures, and records on lots are maintained for these relays. Components used internally to the relay shall not require hermetic packaging. Temperature range for screening tests shall be as specified in 3.5 herein.

4.3.2 Inspection of packaging. Inspection of packaging shall be in accordance with MIL-R-28750.

4.4 Methods of inspection. Methods of inspection shall be in accordance with MIL-R-28750.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-R-28750.

6. NOTES

6.1 Notes. Only definitions of the notes specified in MIL-R-28750 shall apply to this drawing.

6.2 Intended use. Relays conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for O.E.M. application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-28750, this drawing will become inactive for new design. The QPL-28750 product shall be the preferred item for all applications.

6.3 Ordering data. The contract or purchase order should specify the following:

a. Complete PIN (see 1.2).

b. One copy of the quality conformance inspections as required in 4.3, to be shipped with each lot.

c. Requirements for packaging and packing.

6.4 Replaceability. Relays covered by this drawing will replace the same generic device covered by a contractor prepared specification or drawing.

6.5 Comments. Comments on this drawing should be directed to DESC-ELDM, Dayton, Ohio 45444-5765, or telephone 513-296-6189, fax 513-296-8868.

6.6 Submission of certificate of compliance. The certificate of compliance submitted to DESC-ELDM, prior to listing as an approved source, shall state the manufacturer's product meets the requirements herein.

6.7 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have agreed to this drawing and a certificate of compliance (see 3.11) has been submitted to DESC-ELDM.

DESC drawing number	Vendor CAGE number	Vendor similar part number
85007-001	16170	690-1
85007-001	31757	53023Y

Vendor CAGE number	Vendor name and address
16170	Teledyne Electronic Technologies 12964 Panama Street Los Angeles, CA 90066-6534 Phone (310) 822-8229
31757	Micropac Industries, Inc. 905 E. Walnut Street Garland, TX 75040-9017 Phone (214) 272-3571